Community Action to Reduce Mortality due to COVID19 in Puerto Rico

Mark Grabowsky, MD, MPH
March 24, 2020
Deaths by country for countries with at least 25 deaths

- Reported
- Partial (today)

Deaths double every day

...every 2 days

...every 3 days

Italy

Mainland China

U.K.

Spain

France

United States

Netherlands

Germany

Switzerland

Turkey

Indonesia

Japan

South Korea

Through March 24
Outline of this talk:

1. Current situation in Puerto Rico
2. High risk group for mortality
3. Suggested goal of Puerto Rican communities
4. Lessons from control of other pandemics
Factors favoring coronavirus mortality compared to rest of USA:

• Third highest rate of urbanization (93.6%)
• Third highest rate of >65-year-olds (20.3%)
• Lowest per capita income and highest unemployment rate
### Total de Personas Evaluadas o bajo Evaluación
- Departamento de Salud = 280
- Sistema de Veteranos = 69
Total = 349

### Edad Promedio de las Personas Evaluadas y bajo Evaluación
- Promedio = 49.4 ± 21.8 (Mediana = 49.0 años)

### Cantidad de Casos Positivos (Confirmados)
- Departamento de Salud = 23
- Sistema de Veteranos = 16
Total = 39

### Muertes
- Total = 2

### Fecha y Hora de la Actualización de esta Información (Referencia)
- Lunes, 23/marzo/2020
- 10:00 PM

### Curva Epidémica y otros Datos COVID-19 Puerto Rico

- **Casos Positivos (31)**
  - F = 10 (26%)
  - M = 29 (74%)
  - Edad promedio = 57.9 ± 17.5
  - Edad mediana = No Disponible
  - Edad mínima = No Disponible
  - Edad máxima = No Disponible

- **Home quarantine**
- **Business closure**
- **Curfew**
- **Airport screening**
- **Economic aid package**

**Nota:** Esta gráfica está basada mayormente en la información provista por el Instituto de Estadísticas de Puerto Rico.
Histograma de Edad para los Casos Positivos del Departamento de Salud (n = 23)

35% ≥ 70 years old
Calle San Sebastion, Old San Juan, 6pm, Friday Night
Community transmission is just starting

Compared to rest of USA, Puerto Rico is about two weeks behind in disease spread and about one week ahead on control measures.
High risk groups
Mortality Rates by Age Group

COVID-19 death rate by age in South Korea

COVID-19 death rate by age in China

Source: Korea Centers for Disease Control and Prevention

Source: Chinese Center for Disease Control and Prevention
Deaths among first 4,221 COVID19 cases with known outcomes, by age group. US, Feb 12-March 16, 2020

Projected COVID19 Proportion of Deaths by Age for Puerto Rico (Global age-specific fatality rates applied to Italy case ages)

% >65
Italy 22.7%
Puerto Rico 20.2%

Sources: https://www.statista.com/statistics/1103023/coronavirus-cases-distribution-by-age-group-italy/
Proposed High Impact Goal:

Each community should adopt the goal of having zero deaths in its elderly.

Key concepts:

• Each Community
• Zero Deaths
• Elderly
What is the impact of strategies targeting the elderly?
Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand


On behalf of the Imperial College COVID-19 Response Team

WHO Collaborating Centre for Infectious Disease Modelling
MRC Centre for Global Infectious Disease Analysis
Abdul Latif Jameel Institute for Disease and Emergency Analytics
Imperial College London
Mathematical model of relative impact of intervention applied nationally for 3 months in GB on total deaths and peak hospital use after ICU need reaches 1,000 beds/week.

Adapted from From: N Ferguson et al. Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand. Imperial College Response Team, 16 March 2020.
Mathematical model of relative impact of intervention applied nationally for 3 months in GB on total deaths and peak hospital use after ICU need reaches 1,000 beds/week.

“[T]he most effective combination of interventions (to prevent deaths) is predicted to be a combination of case isolation, home quarantine and social distancing of those most at risk (the over 70s). In combination, this intervention strategy is predicted to reduce peak critical care demand by two-thirds and halve the number of deaths.”

Adapted from From: N Ferguson et al. Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand. Imperial College Response Team, 16 March 2020.
Analysis of 25,000 Lab-Confirmed COVID-19 Cases in Wuhan: Epidemiological Characteristics and Non-Pharmaceutical Intervention Effects

Xihong Lin
Department of Biostatistics and Department of Statistics
Harvard University and Broad Institute

xlin@hsph.Harvard.edu
Wuhan

Population size: 11M
Wuhan CDC (n=25,961): December 8 – February 18
A little epidemiology . . .

\( R \) describes how fast an outbreak grows or declines

\[ R \propto \text{Number of Contacts} \times \text{Risk of transmission per contact} \]

- Can be reduced by social distancing
- Can be reduced by personal protection

Current \( R = \sim 3 \)

Goal \( R < 1 \)

Need to reduce current transmission by about 70% to reach \( R < 1 \)
Key Point: Wuhan Experience tells us the COVID-19 Outbreak Can Be Controlled by Effective Interventions: Active Quarantine

Initial quarantine reduced $R$, but not enough and cases still increased.

Intensive quarantine reduced $R < 1$ and stopped transmission.
# A sample strategy to protect high risk groups

<table>
<thead>
<tr>
<th>Risk Groups</th>
<th>Shelter in Place</th>
<th>Family distancing</th>
<th>Strict Social distancing</th>
<th>Strict Personal Sanitation</th>
<th>Social distancing</th>
<th>Personal sanitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age ≥75</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Close contacts with elderly: Caretakers, Home health aides</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age &lt;75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Well-controlled medical conditions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adapted from: David L Katz, A Proposed Risk-Based Interdiction of Coronavirus
Implications of Intensive Control Measures

• These or strategies places enormous demand on the elderly and the support communities.

• Struggling communities cannot be successful without external inputs, especially over the long term (~4 months?).
Lessons Learned from
Long-term Successful Global Disease Control
Lesson from Poliovirus Eradication:

Community-based Microplanning
BEST PRACTICES IN INNOVATIONS IN MICROPLANNING FOR POLIO ERADICATION

THIS DOCUMENT IS A SUPPLEMENT TO "BEST PRACTICES IN MICROPLANNING FOR POLIO ERADICATION".
Lesson from HIV Pandemic Control:

“The Three Ones”
“Three Ones” key principles

“Coordination of National Responses to HIV/AIDS”
Guiding principles for national authorities and their partners

- **One** agreed HIV/AIDS Action Framework that provides the basis for coordinating the work of all partners.
- **One** National AIDS Coordinating Authority, with a broad based multi-sector mandate.
- **One** agreed country level Monitoring and Evaluation System.
Lesson from Malaria Control:

Leakiness vs ‘Rational Redistribution’
Poverty and food security: drivers of insecticide-treated mosquito net misuse in Malawi

Sara Berthe, Steven A. Harvey, Matthew Lynch, Hannah Koenker, Vincent Jumbe, Blessings Kaunda-Khangamwa & Don P. Mathanga

Malaria Journal 18, Article number: 320 (2019) | Cite this article

1284 Accesses | 17 Altmetric | Metrics

Abstract

Background

Over the past decade, food insecurity, connected to erratic rains and reduced agricultural outputs, has plagued Malawi. Many households are turning to fishing to seek additional sources of income and food. There is anecdotal evidence that insecticide-treated net (ITN) recipients in Malawi are using their nets for purposes other than sleeping, such as for fishing, protecting crops, and displaying merchandise, among others. The objective of this qualitative study was to explore the factors leading residents of waterside communities in Malawi to use ITNs for fishing.
Putting it all together: Proposed Strategy

• Community ownership of goal of zero deaths
• Intensive community support to > 70 and service providers
• Community micro-plan
• Anticipate, adopt, and share local innovations
• Unitary planning, management and monitoring
Leadership and effective community response during the 1918 flu pandemic in New York:

Health Commissioner Dr. Royal Copeland “was able to draw upon the much bigger network of the city’s civil society — social workers, labor unions, medical researchers, feminists, housing reformers, progressive activists of all kinds — and these, happily, are resources we have with us still.”

Modelling resources for COVID-19:


[https://www.medrxiv.org/content/10.1101/2020.03.17.20037689v1](https://www.medrxiv.org/content/10.1101/2020.03.17.20037689v1)

Neil Ferguson et al. *Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand*

